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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/527,704	09/15/2005	Stephan Geiger	033033-025	5281

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BUCHANAN, INGERSOLL & ROONEY PC
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EXAMINER

ZHANG, YUANDA

ART UNIT	PAPER NUMBER
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2828

MAIL DATE	DELIVERY MODE
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05/08/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/527,704

Applicant(s)

GEIGER ET AL.

Examiner

Yuanda Zhang

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 September 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 09/15/05 3/11/05
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on 09/15/07 is being considered by the examiner.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 5 recites the limitation "said asymmetrical optical resonator" in the second line. There is insufficient antecedent basis for this limitation in the claim. The word "asymmetrical" should be deleted.

Claim Objections

5. Claim 9 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. This claim merely discloses a use of the solid-state laser device in a series of processes rather than further limiting its structures.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1 and 3-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Chen et al ("Efficient High-Power Diode-End-Pumped TEM₀₀ Nd:YVO₄ Laser", IEEE Photonic Technology Letters, IEEE Inc., New York, US, Vol. 11, no. 10 Oct 1999, p1241-1243).

8. In re claim 1, Chen et al disclose diode-pumped solid-state laser having at least one intracavity positioned laser crystal having at least one optical axis longitudinally to which at least one pumped-light beam emitted from at least one pumped-light source is incident on said laser crystal, wherein said pumped-light beam has a beam diameter corresponding to at least 1.25 times the beam cross section of a laser beam forming inside the resonator with the oscillation mode TEM₀₀ (fiber has a 0.8mm diameter and the TEM₀₀ radii at the Nd:YVO₄ crystal are calculated as 260-300 μm , p1241, second column).

9. In re claim 3, Chen et al disclose said TEM₀₀ mode beam diameter is defined by the mirror radii of the resonator mirrors, the length of said resonator, and said intracavity positioning of said laser crystal, and said beam diameter of said pumped-light beam is adjustable by means of an imaging optic (inherent, see figure 1).

10. In re claim 4, Chen et al disclose an intracavity quality switch in form of an acousto-optical Q-switch is provided (see figure 1).
11. In re claim 5, Chen et al disclose said optical resonator has a convex-concave resonator construction (see figure 1).
12. In re claim 6, Chen et al disclose said laser crystal is doped with Nd (see abstract).
13. In re claim 7, Chen et al disclose said laser crystal comprises Nd:YVO₄ (see abstract).
14. In re claim 8, Chen et al disclose at least one of the said pumped-light beams has a power of up to 60W (p 1242, lower right section).
15. In re claim 9, Chen et al disclose a diode-pumped solid-state laser. The claim merely details the methods of forming the device. The method of forming a device is not germane to the patentability of the device itself; therefore these limitations of a series of processes in claim 9 are not given patentable weight. At best these claims could be characterized as product-by-process claims, where the process limitations are not limiting, only the structure implied by the process. See MPEP 2113. Here, the structure implied by the process steps is merely the structure of claim 1.

Claim Rejections - 35 USC § 103

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

17. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al ("Efficient High-Power Diode-End-Pumped TEM₀₀ Nd:YVO₄ Laser", IEEE Photonic Technology Letters, IEEE Inc., New York, US, Vol. 11, no. 10 Oct 1999, p1241-1243) in view of Honea et al ("183-W, M₂ = 2.4 YB:YAG Q-Switch Laser", Optics Letters, Optical Society of America, Washington, US, Vol. 24, no. 3 Feb, 1999, p 29).
18. In re claim 2, Chen et al have disclosed the claimed invention above except a beam quality of $M^2 \geq 1.8$.
19. However, Honea et al disclose a quarter wave plate between the high reflector and a negative lens in the laser system which produces a beam quality of $M^2 = 3.2$ (p 29, lower middle section).
20. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the beam quality of Chen et al with $M^2 \geq 1.8$, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233 MPEP 2144.05 (II-A)

Conclusion

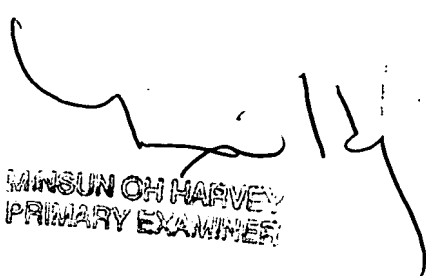
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yuanda Zhang whose telephone number is 571-270-1439. The examiner can normally be reached on Monday-Thursday, Alternating Fri 8:30am-6:00p EST.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun Harvey can be reached on 571-272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

YZ
04/23/07


MINSUN OH HARVEY
PRIMARY EXAMINER